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09/786,553	03/07/2001	Cedric Lapaille	Q63090	3727

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EXAMINER	
PERILLA, JASON M	

ART UNIT	PAPER NUMBER
2634	4

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/786,553	Applicant(s) LAPAILLE ET AL.	
	Examiner Jason M Perilla	Art Unit 2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 March 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-12,14 and 15* is/are rejected.

7)☒ Claim(s) *7 and 13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 March 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/7/01*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims1-15 are pending in the instant application.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on March 7, 2001 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Specification

4. The preliminary amendment received March 7, 2001 states that a substitute abstract was submitted, but it is not found in the amendment and is not entered. If the Applicant wishes to amend the abstract, the Examiner requests that the Applicant must re-submit the amendment.

Claim Objections

5. Claim 4 recites the limitation "the noise level". There is insufficient antecedent basis for this limitation in the claim.

6. Claim 5 recites the limitation "the noise value". There is insufficient antecedent basis for this limitation in the claim.

7. Claim 7 recites the limitation "the noise value". There is insufficient antecedent basis for this limitation in the claim.

8. Claim 11 recites the limitation "the transmitter". There is insufficient antecedent basis for this limitation in the claim.

9. Claims objected to because of the following informalities:

Regarding claim 3, the claim relates to characterizing a method to filter the noise signal. However, the claim provides limitations for finding the *value of the noise* to be used in the signal-to-noise ratio (SNR) calculation (signal divided by the *noise value*) by using a statistical distribution of noise samples. One skilled in the art may be confused by the use of the term "filter". Although, as relating to the claim, it is understood that the use of a statistical distribution of noise samples for finding a common noise value for the SNR calculation equates to "filtering" the noise signal, it is suggested that the claim is more clearly written to exemplify that the statistical distribution observed is utilized to produce a *value of the noise* signal for a subsequent SNR calculation.

Regarding claim 4, no proper distinction is made between the "noise level" of line 2 and the "noise level" of line 3. The "noise level" of line 2, which is lacking antecedent basis, is understood by the Examiner to be a product of the observation of the statistical distribution as determined by claim 3. However, it is not clear or definite to equate the noise level of line 2 with the noise level of line 3. Rather, the noise level of line 3 must be understood to be, for instance, any one of the noise samples or the noise signal as a whole. In other words, the claim is only clear and definite if it reads that the noise level used for the SNR calculation as derived from the observation of the statistical distribution of the noise signal samples has a value such that the probability that any

one of the noise signal samples exceeds the noise level is less than a predetermined threshold. The Applicant is requested clarify the language of the claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang (5918184).

Regarding claim 1, Wang discloses a method of estimating the signal-to-noise ratio of a wanted signal (abstract), in particular a digital signal (col. 3, lines 10-15), received by a radiocommunications receiver (fig. 1), characterized in that, to minimize the estimation noise of the signal-to-noise ratio, the signal (col. 4, lines 4-11) and the noise (col. 4, lines 12- 52) are estimated separately (fig. 1) and the signal and the noise are filtered separately (fig. 1, refs. 34 and 42) before division (col. 4, lines 53-58) of the signal by the noise. Wang discloses the use of a comparator for division of the signal by the noise, however it would have been obvious to one of ordinary skill in the art that the SNR is found by the division of the signal by the noise. Hence, it is obvious to one of ordinary skill in the art that the comparator may be replaced by a division component. Further, it is inherent that the prior art reference Wang will minimize the estimation of

noise at least as well as the claimed embodiment of instant application because the method of Wang is identical to the claimed invention of the Applicant.

Regarding claim 2, Wang discloses the limitations of claim 1 as applied above. Further, Wang discloses that the filtering of the noise signal (fig. 1, ref. 42; col. 4, lines 35-53) is different from that of the wanted signal (fig. 1, ref. 34, col. 4, lines 8-11). Although some aspects of the filter for the wanted signal and the filter for the noise signal may be similar, they are not the same as disclosed by Wang.

Regarding claim 8, Wang discloses the limitations of claim 1 as applied above. Further, Wang discloses that a finite or infinite impulse response low-pass filter is used to filter the noise signal (fig. 1, ref. 42; col. 4, lines 35-53).

Regarding claim 9, Wang discloses the limitations of claim 1 as applied above. Further, Wang discloses that the filter for the noise signal (fig. 1, ref. 42; col. 4, lines 35-53) comprises both an IIR and an FIR filter, but discloses the filter for the wanted signal to be an IIR filter (fig. 1, ref. 34, col. 4, lines 8-11). However, Wang teaches, in reference to the filter for the noise signal, that an FIR filter affords the advantage of greater linearity as compared to IIR filters. Therefore, it would have been obvious to utilize a pure FIR filter as taught by Wang in reference to the noise filter for the filter of the wanted signal because is could advantageously be used if a filter having greater linearity is required.

Regarding claim 11, Wang discloses the limitations of claim 9 as applied above. Further, Wang discloses that the transmitter provides a reference signal with a regular period at a particular level and the signal-to-noise ratio is estimated from that reference

signal (col. 1, lines 27-43). Wang discloses that the SNR of the supervisory audio tone (SAT) is calculated.

Regarding claim 12, Wang discloses the limitations of claim 1 as applied above. Further, Wang discloses that an infinite impulse response filter is used to filter the estimate of the wanted signal (fig. 1, ref. 34, col. 4, lines 8-11).

12. Claims 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of Dapper et al (5809065).

Regarding claim 3, Wang discloses the limitations of claim 1 as applied above. Wang discloses the use of a filter but does not disclose that a statistical distribution is observed. However, Dapper et al teaches a method of estimating a SNR wherein an average of the noise is taken (fig. 2, ref. 28; col. 2, lines 34-67). Because Dapper et al teaches that the average of the noise (fig. 2, ref. 30) is taken before it divides (fig. 2, ref. 38) the signal (fig. 2, ref. 36), it is inherent that the statistical distribution of the noise power measurements is observed for a particular period during which a statistically representative number of measurement samples is collected and which is sufficiently short for the noise to remain practically stationary. An average is, by definition, an observation of a statistical distribution. Therefore, it would have been obvious to one of ordinary skill in the art at the time which the invention was made to utilize an average of the noise signal over an observation period as taught by Dapper et al in place of the filter of Wang because the average of the noise signal over an observation period of the statistical distribution of the noise signal samples is a good representation of the noise for finding the SNR.

Regarding claim 4, Wang et al in view of Dapper et al disclose the limitations of claim 3 as applied above. Further, it is inherent that the "noise average" determined by the observation period of the statistical distribution of noise samples for the calculation of the SNR would be chosen such that the probability of any of the actual noise signal samples being greater than the "noise average" is less than a predetermined threshold. For instance, in the case that the observation period of the statistical distribution of the noise samples yields *the average* of the noise samples as the "noise average" as disclosed by Dapper et al for calculation of the SNR, *the average* is the predetermined threshold.

Regarding claim 5, Wang et al disclose the limitations of claim 3 as applied above. Further, it is obvious that the "noise value" derived during the observation period of the statistical distribution of the noise signal samples for calculation of the SNR would be chosen to be the maximum noise signal sample over the observation period. In this case, the most robust system possible could be acquired. Because the choice of the "noise value" is the largest of the noise signal samples over the observation period, the SNR would be the lowest possible for the channel conditions. Thereby, the system would adapt to use the most transmission power from the transmitters and would utilize the least number of available channels to allow for the best possible reception between users.

Regarding claim 6, Wang et al in view of Dapper et al disclose the limitations of claim 3 as applied above. Further, Dapper et al discloses calculating the average of the statistical distribution during the observation period (fig. 2, ref. 28; col. 2, lines 34-67).

The average is a moment of the distribution. Further, Dapper et al makes reference to the calculation of the variance of the noise (col. 2, lies 59-60). Therefore, Dapper et al discloses that the moments of the distribution are determined.

13. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of Arens et al (5301364).

Regarding claim 10, Wang discloses the limitations of claim 9 as applied above. Wang does disclose the use of an FIR filter, but does not disclose that the FIR filter is an averaging FIR filter. However, Arens et al teaches a FIR filter being an averaging filter (col. 6, lines 10-14). Further, the use of FIR filters as averaging filters is well known and understood in the art, and it is obvious that the use of an averaging filter would be applied because the average of the wanted signal would be used for calculating the SNR. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize a averaging FIR filter as taught by Arens et al in the method of Wang because the average of the wanted signal could be effectively used to calculate the SNR.

14. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of Buternowsky et el (5809090).

Regarding claim 14, Wang discloses the limitations of claim 12 as applied above. Wang does not disclose that packets are received and subsequently filtered. However, one skilled in the art is notoriously aware of the use of packets in digital transmission. Further, as reference to the use of packets in digital communications, Buternowsky et al discloses the use of packets in a digital communications method (col. 5, lines 1-10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize packets in the digital communication method as exemplified by Buternowsky et al in the method of Wang because it provides an exemplary means of transmitting digital data well known in the art.

15. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of Davidovici et al (5719898).

Regarding claim 15, Wang discloses the limitations of claim 1 as applied above. Wang does not disclose estimating the signal-to-noise ratio in a telecommunications receiver for sending data to the respective transmitter for controlling the output signal power of the transmitter. However, Davidovici et al teaches a method wherein the signal-to-noise ratio information at the receiver is used to alter the transmission power of the corresponding transmitter (col. 3, line 10-col. 4, line 60). Davidovici et al teaches that the method provides an adaptive transmission system in fading environments (col. 3, lines 9-11). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to transmit signal-to-noise data from the receiver to the transmitter to adaptively vary the transmission power of the transmitter over a fading channel as described by Davidovici et al in the method of Wang because it would provide for an adaptive system in a channel which many vary.

Allowable Subject Matter

16. Claims 7 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following prior art not relied upon above is cited to further show the state of the art with respect to SNR calculation.

U.S. Pat. No. 5559790 to Yano et al; Adaptive power transmission.

U.S. Pat. No. 4835790 to Yoshida et al; Carrier-to-noise detector.

U.S. Pat. No. 5440582 to Birchler et al; Method for signal usability.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M Perilla whose telephone number is (703) 305-0374. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Chin can be reached on (703) 305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jason M Perilla
April 15, 2004

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